DIVISION VII – TRAFFIC CONTROL DEVICES

SPECIAL PROVISION COPIED NOTES (SPCNs), SPECIAL PROVISION (SPs) and SUPPLEMENTAL SPECIFICATIONS (SSs)

VDOT web file users ("pdf") may obtain more information and other resources by downloading the accompanying "zip" file (compressed WORD® files).
http://www.virginiadot.org/business/resources/const/07ImpRev.zip

These sheets may also be found at the following locations:
Global Web Access: http://www.virginiadot.org/business/const/spec-default.asp

VDOT Only Access: http://insidevdot/sites/SanC/specs/2007specs/2007_Standard_Specifications/Forms/AllItems.aspx

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TABLE OF CONTENTS

*These SPECIFICATIONS REVISIONS are subject to change on short notice.

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1-
2-
3-
4-
5-
6-
7-

——STANDARD 700 SERIES SPCNs (SPECIAL PROVISION COPIED NOTES)——

*These SPECIFICATIONS REVISIONS are subject to change on short notice.

GUIDELINES – ASPHALT MAINTENANCE PROJECTS (SLURRY SEAL AND LATEX ONLY).

(**c704bm0**-1109) **COVERING CLEANING AND INSPECTING EXISTING RAISED PAVEMENT MARKERS** - The Contractor shall cover all existing raised pavement markers by an approved method and material to protect and ensure the integrity of the markers prior to resurfacing. After completion of the resurfacing operation the covering shall be removed, the raised markers cleaned and inspected to insure they are fully operational. Any raised markers damaged by the Contractor's operations shall be replaced by the Contractor at no expense to the Department. The covering, cleaning, and inspection of the raised markers will not be measured for payment and all cost for performing this work shall be included in the price bid for other items of work.

8-29-08 (SPCN)

GUIDELINES – ASPHALT MAINTENANCE PROJECTS (SURFACE TREATMENT ONLY).

(**c704cm0**-1109) **SWEEPING PRIOR TO PAVEMENT MARKING** - No earlier than 7 days after completion of surface treatment the Contractor shall sweep the roadway surface prior to installation of pavement markings. Pavement markings shall be installed within 14 days after completion of surface treatment. The cost of sweeping the roadway prior to installing pavement marking shall be included in the price bid for pavement marking.

9-18-01a (SPCN)

——SELECT USE 700 SERIES SPECIAL PROVISION COPIED NOTES (SPCNs)——

The following are Select Use Special Provision Copied Notes. None have been through the Department's complete Specifications Committee review/comment/acceptance process and are not part of the Standard Specifications. They are to be considered as project-specific and may be subject to modifications required to meet specific project conditions or requirements for Federal funding. Anyone making modifications is responsible for obtaining the appropriate expertise in the discipline applicable to the modification. If modifications are made the date must also be changed to reflect the current date. Please send a copy of the modified special provision copied note with the new date and specific project number to David.Gayle@VDOT.Virginia.gov so it may be added to the Specifications Stockpile.

cu703000a Saw Cut (Loop Detectors)

GUIDELINES – ASPHALT MAINTENANCE PROJECTS WHEN REQUIRED BY THE DESIGNER (USUALLY HAMPTON ROADS DISTRICT).

SAW CUT — Section 703.04—Measurement and Payment of the Specifications is amended to replace the ninth paragraph (**Saw cuts**) with the following:

> **Saw cut** will be measured in linear feet for the width specified and will be paid for at the contract unit price per linear foot. This price shall include cutting, cleaning, drilling, disposing of surplus material, furnishing and installing backer rods, and loop sealant material.

Pay Item	**Pay Unit**
Saw Cut (Width)	Linear foot

10-2-08a (SPCN)

——STANDARD 700 SERIES SPs (SPECIAL PROVISIONS)——

GUIDELINES — FOR PROJECTS REQUIRING TYPE B, CLASS VI PAVEMENT LINE MARKING.

S704E01-0309

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION FOR
TYPE B, CLASS VI PAVEMENT LINE MARKING

November 21, 2008

I. DESCRIPTION

This work shall consist of furnishing and installing a self adhesive white or yellow preformed pavement line marking at locations shown on the plans and as directed by the Engineer.

II. MATERIALS

Preformed pavement line marking shall be a retro-reflective pliant polymer material consisting of a mixture of polymeric materials, pigments and glass beads distributed throughout its cross-sectional area with a reflective layer of beads embedded into the surface. The markings shall be suitable for use one year after the date of receipt when stored in accordance with the manufacturer's recommendations.

The new marking shall have the following reflectance values when tested in conformance with the requirements of ASTM E 1710. The photometric quantity to be measured shall be specific luminance (SL), expressed as millicandelas per square foot per foot-candle.

INITIAL REFLECTANCE VALUES

Specific Luminance	**White = 500**	**Yellow = 300**

The glass beads on the surface of the material shall have a refractive index of no less than 1.70 when tested using the liquid oil immersion method. The glass beads mixed into the pliant polymer shall have a refractive index of no less than 1.5 when tested by the liquid oil immersion method.

Bead adhesion shall be such that beads are not easily removed when the film surface is scratched firmly with a thumbnail.

The material without adhesive shall have a minimum caliper of 0.065 inch at the thickest portion of the cross-section, and a minimum caliper of 0.020 inch at the thinnest portion of the cross-section.

The surface of the retro-reflective pliant polymer shall provide an initial skid resistance value of no less than 45 BPN when tested according to the requirements of ASTM E-303-83.

The preformed marking materials shall be capable of conforming to pavement contours, breaks and faults through the action of traffic at normal pavement temperatures. The material shall be capable of being adhered to asphalt or hydraulic cement concrete by a precoated pressure sensitive adhesive. The marking shall be capable of being inlaid during a paving operation on new, dense, or open graded asphalt concrete and shall be ready for traffic immediately after application.

The marking shall be a neat, durable marking that will not flow or distort due to temperature if the pavement surface remains stable. The pliant polymer shall provide a cushioned, resilient substrate that reduces bead crushing and loss. Markings shall be weather resistant and shall show no significant tearing, roll back, lifting, shrinkage, or other signs of poor adhesion, nor appreciable fading, which will impair the intended usage of the marking throughout its intended life.

When the pay item specifies Type B, Class VI contrast pavement line marking, the preformed tape shall be an additional 3 inches minimum wider than the width specified in the pay item. This additional tape width shall be black non-reflective with 1 1/2 inches minimum on both sides of the white.

III. INSTALLATION

Surface preparation, use of solvents and primers, and equipment used in the application of the markings shall be in accordance with the manufacturer's recommendations. Marking configurations shall be in accordance with the 2003 edition of the "Manual on Uniform Traffic Control Devices". Unless otherwise indicated, markings installed on new asphalt concrete roadway surfaces shall be inlaid into the surface with the last pass of the asphalt roller (if allowed by tape manufacturer) or directly after the asphalt roller utilizing a separate roller for the tape whereby the marking becomes embedded within the pavement. Temperature requirements of the asphalt and the type of roller allowed shall be in accordance with the tape manufacturer's recommendations. The Contractor shall ensure that inlaid markings are not degraded by the pavement operation.

Markings shall not be installed directly over longitudinal pavement joints.

IV. TESTING

Visual night inspections will be made by the Engineer with both Contractor and a manufacturer's representative to identify areas of the pavement markings appearing to reflect below the specified reflectance values. Such areas shall be tested by the Contractor to measure the reflectance values. Pavement markings to be tested shall be clean and dry. Testing shall be performed as designated herein. Those markings found to be less than the values listed herein shall be replaced by the Contractor at no cost to the Department. All costs associated with replacement of inadequate markings shall be borne by the Contractor.

Testing shall be performed using equipment that conforms to the requirements of ASTM E 1710 at a minimum temperature of 40 degrees F in accordance with the following:

TESTING REFLECTANCE VALUES

	White	**Yellow**
Specific Luminance Average Value, Minimum	200	150

Test areas will be equal to three miles or less and shall have a minimum of three check points for each type marking therein. Measurements for skip lines shall be 18, distributed over 6 lines at each check point. Measurements for center and edge lines shall be 18, distributed over 300 feet or less of continuous marking. Markings more than 6 inches in width shall have 1/3 of its measurements on the right edge, 1/3 on the axis and 1/3 on the left edge.

Measured reflectance values, at each check point, will be averaged by type marking to determine conformance to the test reflective values.

All costs associated with testing the markings for reflectance values including but not limited to the cost of maintenance of traffic and the reflectometer shall be borne by the Contractor.

V. MEASUREMENT AND PAYMENT

Type B, Class VI pavement line marking will be measured in linear feet for the width specified and will be paid for at the contract unit price per linear foot, which price shall be full compensation for furnishing and installing pavement line markings, surface preparation, and testing.

Payment will be made under:

Pay Item	Pay Unit
Type B, Class VI pavement line marking (Width)	Linear foot
Type B, Class VI contrast pavement line marking (Width)	Linear foot

GUIDELINES – FOR PROJECTS REQUIRING PAVEMENT MARKING WHERE THERE MAY BE NOT BE TIME TO INSTALL THE USUAL TEMPORARY PAVEMENT MARKING BEFORE TRAFFIC IS ALLOWED ON THE PAVEMENT.

S704F01-1209

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION FOR
TRANSITORY PAVEMENT MARKERS (TPM)

December 14, 2009

I. DESCRIPTION

This work shall consist of furnishing, installing and removing transitory pavement markers (TPM) in lieu of temporary construction pavement markings at locations specified in the Contract and as directed by the Engineer.

II. MATERIALS

Transitory pavement markers (TPM) shall consist of products from the Department's current Approved List found in the Materials Division's Manual of Instructions (See Transitory Pavement Markers) or web site http://www.virginiadot.org/business/materials-download-docs.asp. All TPMs shall be new product. The color of TPM (white or yellow) shall be the same as the temporary pavement markings for which they are being used in substitution.

TPM shall be suitable for use one year after the date of receipt when stored in accordance with the manufacturer's recommendations.

III. INSTALLATION

Prior to beginning the installation of pavement markings the Contractor shall determine if there is sufficient time to install pavement markings within the time limits specified in Section 704 of the Specifications. If the Contractor determines that there is insufficient time to install pavement markings within the time limits specified in Section 704 of the Specifications, the Contractor shall install temporary construction pavement markings or submit a plan to the Engineer for approval for substituting TPM for such temporary construction pavement markings within the same time limits. The Contractor's plan for such shall be in accordance with the requirements of the drawings herein.

Prior to installing TPM, the pavement surface shall be dry and air blown or thoroughly brushed to remove debris, dirt and dust.

Installation, maintenance and removal of TPM shall be accomplished on a continuous basis in accordance with the manufacturer's recommendations, the drawings herein and as directed by the Engineer.

Damaged or missing TPM shall be replaced with new TPM of the same manufacturing type and model. No more than one TPM may be damaged or missing out of every broken line simulated segment. No two consecutive TPM may be damaged or missing on a simulated solid line, and no more than 30 percent of the TPM may be damaged or missing on any measured 100-foot segment of simulated solid line.

Where TPM are to be used in substitution for lane division lines, either broken (skip) line segments or for solid line segments, no edgeline marking will be required.

TPM shall not be in place for more than ten consecutive days.

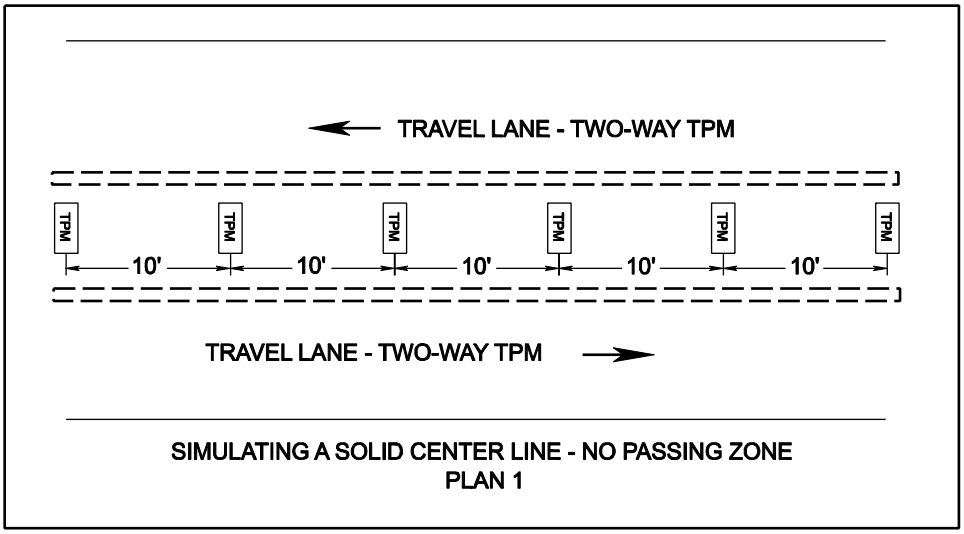
The Contractor shall maintain transitory pavement markers until the final pavement markings can be installed.

The Contractor shall remove from the work site all containers, packaging, unused markers, damaged markers and markers removed from the pavement after use and properly dispose of such.

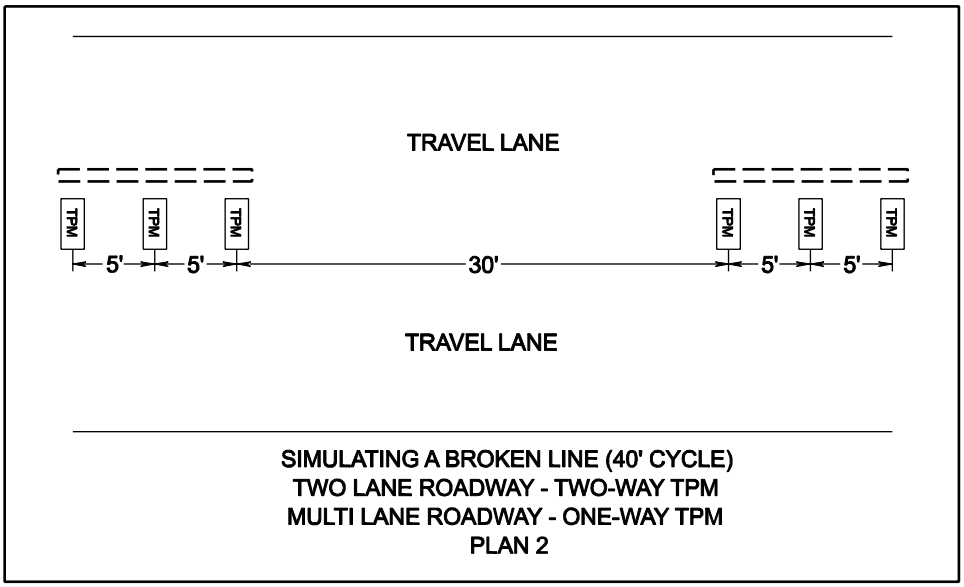
IV. MEASUREMENT AND PAYMENT

Transitory pavement markers (TPM) will not be measured for separate payment, the cost of which, shall be included in the price bid for pavement line making. Such price shall be full compensation for furnishing and installing pavement markers, surface preparation, adhesive, maintaining and replacing lost or damaged markers, and removing the pavement markers and adhesive when no longer required.

TYPICAL PLAN FOR TPM PLACEMENT



SIMULATING A SOLID CENTER LINE - NO PASSING ZONE
PLAN 1



SIMULATING A BROKEN LINE (40' CYCLE)
TWO LANE ROADWAY - TWO-WAY TPM
MULTI LANE ROADWAY - ONE-WAY TPM
PLAN 2

*** SIMULATES PAVEMENT MARKINGS

GUIDELINES – ASPHALT MAINTENANCE PROJECTS (PLANT MIX ONLY).

S704GM0-0609

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION FOR
REPLACEMENT OF PAVEMENT LINE MARKINGS, MARKERS AND LOOP DETECTORS
(Maintenance)

October 2, 2008

All Districts:

Certain plant mix line items will be designated to have traffic engineering items (pavement marking/markers and loop detectors) replaced under this contract. Replacement of pavement line markings, markers and loop detectors shall have the same time and date requirement or restrictions that pertain to the plant mix line items and shall be in accordance with the following, unless otherwise specified:

1. Pavement Markings shall be installed within the time limits set forth in Section 704 of the Specifications.

2. Pavement Markers shall be installed within 30 calendar days after resurfacing the affected area. They shall not be installed prior to the installation of such pavement markings as centerlines and lane lines.

3. Loop Detectors shall be installed in accordance with the requirements of Section 703 of the Specifications.

All Districts except Hampton Roads:

When determined by the Engineer that loop detectors will be installed in the new surface mix, the loop detectors and associated work to place the detector into operation shall be installed within 72 hours after resurfacing the affected area.

Hampton Roads District Only:

When replacement of loop detectors is included the Contract, the Contractor will be required to install new loop detector items within the planed surface prior to the placement of new plant mix. Installation of the loop detectors and associated work to place the detector into operation shall be completed within 72 hours after planing the affected area. Installation shall be performed in the presence of the Engineer.

When replacement of loop detectors is not included in the Contract, the Contractor shall notify the Engineer 72 hours prior to planing at locations that contain loop detectors.

GUIDELINES – ASPHALT MAINTENANCE PROJECTS (SURFACE TREATMENT AND SLURRY/LATEX ONLY).

S704H00-1009

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION FOR
SECTION 704—PAVEMENT MARKING AND MARKERS
(Surface Treatment and Slurry/Latex)

September 30, 2009

SECTION 704—PAVEMENT MARKING AND MARKERS of the Specifications is amended as follows:

Section 704.03—Procedures is amended to replace the first six paragraphs with the following:

The Contractor shall have a certified Pavement Marking Technician present during pavement marking operations.

Pavement markings shall be installed on new roadways prior to opening the roadway to traffic. Pavement marking installation shall be completed within the time limits herein on roadways where the pavement markings have been removed or obscured and the roadway is open to traffic unless otherwise directed by the Engineer. Installation of edge lines on roadways where the existing pavement markings have been removed or obscured are also required within these time limits unless otherwise indicated by the Engineer. Exceptions to the below time limits will be granted only for weather restrictions.

Pavement marking installation on roads having traffic volumes of 10,000 ADT or more shall be completed within 14 calendar days after the end of the workday where the pavement markings were removed or obscured. Temporary construction pavement markings will be required within 24 hours after the end of the workday if pavement markings are not installed within such time limit.

Pavement marking installation on roads having traffic volumes between 3,000 and 10,000 ADT shall be completed within 14 calendar days after the end of the workday where the pavement markings were removed or obscured. Temporary construction pavement markings will be required within 48 hours after the end of the workday if pavement markings are not installed within such time limit.

Pavement marking installation on roads having traffic volumes of less than 3,000 ADT shall be completed within 14 calendar days after the end of the workday where the pavement markings were removed or obscured. Temporary construction pavement markings will not be required unless determined and authorized by the Engineer to be necessary to ensure the safety of the traveling public.

The Contractor shall install the type and class of temporary construction pavement markings specified elsewhere in the Contract. The Contractor shall maintain temporary construction pavement markings until the final pavement markings can be installed. The cost of installing, maintaining, and removing the temporary construction pavement markings shall be borne by the Contractor at no cost to the Department.

GUIDELINES – ASPHALT MAINTENANCE PROJECTS (Plant Mix Only).

S704I00-1209

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION FOR
SECTION 704—PAVEMENT MARKING AND MARKERS
(Plant Mix)

November 30, 2009

SECTION 704—PAVEMENT MARKING AND MARKERS of the Specifications is amended as follows:

Section 704.03—Procedures is amended to replace the third, fourth, fifth and sixth paragraph with the following:

Pavement marking installation on roads having traffic volumes of 10,000 ADT or more shall be completed within 14 calendar days after the end of the workday where the existing pavement markings were removed or obscured. Temporary construction pavement markings will be required within 24 hours after the end of the workday if final pavement markings are not installed within such time limit.

Pavement marking installation on roads having traffic volumes between 3,000 and 10,000 ADT shall be completed within 14 calendar days after the end of the workday where the existing pavement markings were removed or obscured. Temporary construction pavement markings will be required within 48 hours after the end of the workday if final pavement markings are not installed within such time limit.

Pavement marking installation on roads having traffic volumes of less than 3,000 ADT shall be completed within 14 calendar days after the end of the workday where the existing pavement markings were removed or obscured. Temporary construction pavement markings will be required within 72 hours after the end of the workday if final pavement markings are not installed within such time limit.

The Contractor shall install the type and class of temporary construction pavement markings specified elsewhere in the Contract. The Contractor shall maintain temporary construction pavement markings until the final pavement markings can be installed. The cost of installing, maintaining, and removing the temporary construction pavement markings shall be borne by the Contractor at no cost to the Department.

GUIDELINES – FOR PROJECTS REQUIRING PAVEMENT MARKING WHERE THERE MAY BE NOT BE TIME TO INSTALL THE USUAL TEMPORARY PAVEMENT MARKING BEFORE TRAFFIC IS ALLOWED ON THE PAVEMENT.

S704JM0-1109

SPECIAL PROVISION FOR
TEMPORARY CONSTRUCTION PAVEMENT MARKINGS (PLANT MIX)

October 13, 2009

Temporary construction pavement markings shall be Type F, Class I pavement markings in accordance with the provisions of Section 704 of the Specifications with a modified application. Such modification shall consist of the light application of Type F, Class I temporary traffic paint, 8 to 10 mils thick and 3 inches wide with 3 pounds of glass beads per gallon of material. Glass beads shall conform to the requirements of Section 234 of the Specifications. Centerline skip lines shall be applied in 8-foot lengths. Temporary Type F, Class I pavement markings shall be arranged and spaced on their installation so as to be completely covered by the application of final pavement markings. No eradication of such modified Type F, Class I temporary markings will be required when the Contractor installs such temporary construction pavement markings as detailed herein and such markings have been in place for no less than 3 days prior to the application of permanent pavement markings.

In lieu of installing temporary construction pavement markings the Contractor may elect to install Transitory Pavement Markings (TPMs) in accordance with the Special Provision for Transitory Pavement Markers (TPM) included in the Contract.

The Contractor shall install temporary construction pavement markings within the time limits specified in Section 704 of the Specifications.

GUIDELINES – FOR PROJECTS REQUIRING PAVEMENT MARKING WHERE THERE MAY BE NOT BE TIME TO INSTALL THE USUAL TEMPORARY PAVEMENT MARKING BEFORE TRAFFIC IS ALLOWED ON THE PAVEMENT.

S704KM0-1209

SPECIAL PROVISION FOR
TEMPORARY CONSTRUCTION PAVEMENT MARKINGS (PLANT MIX)

November 30, 2009

Temporary construction pavement markings shall be either:

- Type D construction pavement markings in accordance with the requirements of Section 704 of the Specifications, or

- Type F, Class I pavement markings in accordance with the provisions of Section 704 of the Specifications with a modified application. Such modification shall consist of the light application of Type F, Class I temporary traffic paint, 8 to 10 mils thick and 3 inches wide with 3 pounds of glass beads per gallon of material. Glass beads shall conform to the requirements of Section 234 of the Specifications. Centerline skip lines shall be applied in 8-foot lengths. Temporary Type F, Class I pavement markings shall be arranged and spaced on their installation so as to be completely covered by the application of final pavement markings. No eradication of such modified Type F, Class I temporary markings will be required when the Contractor installs such temporary construction pavement markings as detailed herein and such markings have been in place for no less than 3 days prior to the application of permanent pavement markings.

In lieu of installing temporary construction pavement markings the Contractor may elect to install Transitory Pavement Markings (TPMs) in accordance with the Special Provision for Transitory Pavement Markers (TPM) included in the Contract.

The Contractor shall install temporary construction pavement markings within the time limits specified in Section 704 of the Specifications.

——SELECT USE 700 SERIES SPs (SPECIAL PROVISIONS)——

The following are Select Use Special Provisions. None have been through the Department's complete Specifications Committee review/comment/acceptance process and are not part of the Standard Specifications. They are to be considered as project-specific and may be subject to modifications required to meet specific project conditions or requirements for Federal funding. Anyone making modifications is responsible for obtaining the appropriate expertise in the discipline applicable to the modification. If modifications are made the date must also be changed to reflect the current date. Please send a copy of the modified special provision with the new date and specific project number to David.Gayle@VDOT.Virginia.gov so it may be added to the Specifications Stockpile.

SU704000A Preform Thermo Pave Marking

GUIDELINES – USE WHEN REQUESTED BY THE PROJECT MANAGER.

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION
PREFORMED THERMOPLASTIC PAVEMENT MARKINGS

June 3, 2008A

I. DESCRIPTION

These specifications provide criteria for furnishing and installing durable, retroreflective preformed thermoplastic material for use in installing pavement markings, message markings and pavement marker applications. Lines, legends and symbol material shall be capable of being affixed (fusing) to asphalt concrete (bituminous) pavements by the use of a heating source.

II. DETAIL REQUIREMENTS

Material shall be a preformed, beaded reflectorized thermoplastic pavement marking material that is applied to the road surface using a heat source such as a propane torch. Upon cooling to normal pavement temperature, the material shall produce a reflectorized message, legend or symbol of specified thickness, width or design capable of resisting deformation to traffic. Material shall not distort because of temperature variations prior to application. The Contractor shall ensure that the pavement surface is clean, dry and free of debris or other deleterious material which may affect performance by removing all dust, dirt, loose particles heavy oil residues and other deleterious materials that may affect proper installation. Manufacturer\Supplier must enclose application instructions (multilingual) in with each box/package of materials.

Material shall be suitable for use on asphalt concrete surfaces and shall be capable of being applied to previously applied pavement marking material of the same composition under normal conditions of use. Marking material must be capable of conforming to pavement contours, breaks and faults through the action of traffic within the range of temperatures as specified herein. The markings shall have resealing characteristics, such that it is capable of fusing with itself and previously applied thermoplastic when heated with the heat source. In addition to being capable of fusing itself over existing markings such new markings shall be furnished to match the size dimensions and shape of existing markings.

Material shall not exude fumes that are toxic or injurious to persons, animals or property when heated to the application temperature.

Material shall withstand air and roadway temperature variations from 0º F to 140º F without deforming, bleeding, staining, discoloring and shall maintain their original dimensions and placement without chipping, spalling, or cracking. Material shall not deteriorate because of contact with sodium chloride, calcium chloride, mild alkalies and acids, or other ice control material; oil in the pavement material; or oil and gasoline drippings from vehicles.

Material, except for reversible arrows, shall have factory applied coated surface and intermixed beads. Intermixed beads shall be uniformly distributed throughout the material at a minimum of 30% by weight. Reversible arrows shall have intermixed beads only. Surface beads for reversible arrows shall conform to the requirements of Section 234 and be furnished and applied by the installer.

Preformed thermoplastic marking materials shall be listed on the "Qualified Products List (QPL)" established by testing under the "American Association of State Highway and Transportation

Officials" (AASHTO), National Transportation Product Evaluation Program (NTPEP) or equivalent. Preformed Thermoplastic tested on the NTPEP test deck or equivalent may have a thickness of 0.125 inches or less. Preformed thermoplastic materials on the QPL have been determined to conform to contract performance requirements herein with certain exceptions. (See footnote on QPL below for additional information regarding acceptance of materials.)

Initial skid resistance value shall be at least 45 BPN when tested in accordance with ASTM E 303.

Retained retroreflectivity, durability and color of markings shall conform to the following requirements after being installed on a northern region test deck for 1 year.

Retroreflectivity: Photometric quantity to be measured is coefficient of retroreflected luminance (R_L) in accordance with the requirements of ASTM E 1710. R_L shall be expressed in millicandelas per square foot per foot per foot-candle and shall be at least the following values when measured in the wheel path area.

	Initial	**Retained (after 1 Year)**
White	300	90
Yellow	200	70

Durability: Material shall have a durability rating of at least 4 when determined in the wheel path area.

Retained Daytime Color: Retained daytime color of markings shall conform to the requirements of ASTM D 6628.

Initial Nighttime Color: Initial nighttime color of preformed thermoplastic plastic pavement marking material shall conform to the following CIE chromaticity coordinate requirements when tested in accordance with VTM 111.

CIE CHROMATICITY COORDINATE LIMITS (INITIAL WITH DROP-ON BEADS)								
Color	**1**		**2**		**3**		**4**	
	x	**y**	**x**	**y**	**x**	**y**	**x**	**y**
Yellow	0.486	0.439	0.520	0.480	0.560	0.440	0.498	0.426

Material shall not be formulated with any compounds of the heavy metals listed in 40 CFR 261.24 Table 1 except that barium sulfate is allowed. Total heavy metal levels, with the exception of barium sulfate, shall not exceed 20 times the specified regulatory limits.

Amount and type of yellow pigment and inert filler for yellow material shall be at the option of the manufacturer provided the material complies with all other requirements of this specification.

Material to be supplied may be of either of the following types:

- Type where the manufacturer requires preheating of the roadway surface to a specified temperature prior to installation of the preformed thermoplastic material.
- Type where the manufacturer requires preheating of the roadway surface prior to installation of the preformed thermoplastic material to only remove moisture when necessary.

Current manufacturer installation instructions will be used to determine which type material a manufacturer produces. A copy of the instructions shall be provided to the Engineer.

Qualified Products List

Ennis

Flame Tape white – NTPEP 2005# PMM-PA-040
Flame Tape yellow lead free – NTPEP 2005# PMM-PA-041

Flint Trading

Premark Plus white – NTPEP# PMM PA-064
Premark Plus yellow lead free – NTPEP# PMM-PA-065

Materials on this list are for 0.125" thickness preformed thermoplastic that have been determined to conform to contract requirements.

When installing over existing thermoplastic markings new preformed thermoplastic pavement markings shall conform to the shape and completely adhere (fuse) to the old existing markings. Materials on this list determined not to conform to these requirements based on this verification testing will not be acceptable.

Materials failing any of the requirements of this provision will be deemed unacceptable and the Contractor shall then furnish acceptable materials meeting these requirements at no additional cost to the contract.

III. DESIGN APPLICATIONS

Crosswalks and stop lines shall be installed using preformed thermoplastic pavement markings conforming to the details and dimensions of the contract. Crosswalk lines shall be 1 foot wide and stop lines shall be 2 feet in width.

Pavement message markings and symbols shall be installed using preformed thermoplastic pavement markings conforming to the designs and dimensions detailed in the contract.

IV. MEASUREMENT AND PAYMENT

Preformed Thermoplastic Pavement Marking will be measured in linear feet or each depending on the configuration of the message marking (linear, message or symbol) as designated in the contract and will be paid for at the contract unit price per linear foot or each as specified by the individual message marking. This price shall include furnishing pavement marking material, message or symbol, surface preparation, primer-sealer, additional surface glass beads, installation, daily log (Form C-85), guarding devices, or other incidentals recommended for installation by the manufacturer.

Payment will be made under:

Pay Item	Pay Unit
Preformed (width) Thermoplastic	Linear foot or Each

SU704001A Pavement Dotting

GUIDELINES – FOR PROJECTS WHERE THE FINAL PAVEMENT MARKINGS WILL BE INSTALLED BY THE DEPARTMENT OR BY OTHER CONTRACTS.

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION FOR
PAVEMENT DOTTING

October 8, 2008a

I. DESCRIPTION

This work shall consist of the furnishing and placing of pavement dots to establish the location of pavement markings on the roadway in accordance with the requirements specified herein and as directed by the Engineer. This work is for those sections of roadways where the final pavement markings will be installed by the Department or by other contracts. Those sections of roadways where the Contractor installs the final pavement markings shall not require pavement dotting, however, premarking may be accomplished at the Contractor's option in accordance with Section 704.03 of the Specifications.

II. MATERIALS

Pavement dots shall be removable tape (Type D, Class I or II) conforming to the requirements of Section 246.02(g)1 of the Specifications. Pavement dots shall consist of 4-inch by 4-inch squares or 4-inch diameter circles and shall be of the same color as the final pavement markings to be installed.

III. PROCEDURES

Pavement dots shall be placed on the new pavement surface for each individual pavement marking line unless otherwise directed by the Engineer. Pavement dots shall be placed in the same lateral position along the roadway where the existing markings were located.

Pavement dots shall be installed at 100-foot intervals in tangent sections and 50-foot intervals in curved sections. Less spacing may be used as needed for but not limited to such pavement markings items as stop lines, crosswalk lines, and hatching. Pavement dotting shall be installed in accordance with the manufacturer's recommendation.

IV. MEASUREMENT AND PAYMENT

Pavement dotting will be measured and paid for at the contract unit price per mile of pavement line dotted, to the nearest one-tenth of a mile. This price shall be full compensation for furnishing and installing the pavement dots, and all materials, labor, tools, equipment and incidentals necessary to complete the work.

Payment will be made under:

Pay Item	Pay Unit
Pavement dotting	Mile

——STANDARD 700 SERIES SSs (SUPPLEMENTAL SPECIFICATIONS)——

GUIDELINES — PROJECTS REQUIRING SIGNS, SIGNALS, LIGHTING OR NAVIGATIONAL LIGHTS.

SS70003-0609 June 9, 2008

VIRGINIA DEPARTMENT OF TRANSPORTATION
2007 ROAD AND BRIDGE SUPPLEMENTAL SPECIFICATIONS

SUPPLEMENTAL SECTION 700—GENERAL

SECTION 700—GENERAL of the Specifications is amended as follows:

Section 700.02(i) the first sentence is replaced with the following:

Poles, posts, and overhead sign structures shall conform to the following:

Section 700.02(i)2. is replaced with the following:

2. **Overhead sign structures, signal poles (mast arm and strain), and high-mast lighting poles** shall be steel.

Section 700.02(i)4. **Poles, posts, and overhead sign structures** is replaced with the following:

4. **Sign posts** shall be wood or steel. Square tube post shall be hot-rolled, carbon sheet steel, structural steel quality, conforming to the requirements of ASTM A 1011, Grade 50 except the yield strength after cold-forming shall be 60,000-psi minimum. Steel mounting brackets shall conform to the requirements of ASTM A36. Posts (inside and outside) shall be galvanized in accordance with the requirements of ASTM A653, Coating Designation G-90.

Section 700.02(i) the first and second paragraph is replaced with the following:

Lighting, signal, pedestal poles; sign posts; and overhead sign structures not designed to support variable message signs shall conform to the requirements of the 1994 Edition of AASHTO's *Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals.*

Overhead sign structures, including "butterfly" structures, designed to support variable message signs shall conform to the requirements of the 2001 Edition of AASHTO's *Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals* and the following clarifications:

- Basic wind speed shall be used in the designs. The alternate method for wind pressures provided in Appendix C shall not be used.

- When the installation location of the structures lies between isotachs, the basic wind speed shall be determined by using the higher adjacent isotach.

- Any optional design parameters indicated in the AASHTO specification that are "allowed when acceptable to the owner" shall not be used for the designs.

Steel poles, posts, and overhead sign structures shall be hot-dip galvanized after fabrication. Except when shop painting is required, steel poles and posts shall be given one shop coat of primer and two field coats of paint and the galvanization finish of overhead sign structures shall be field treated for paint retention and two coats of paint applied.

Section 700.04(a)1. **Grounding Electrodes** is amended to replace the seventh paragraph with the following:

- The Contractor shall install a junction box at the primary grounding electrode location for access to the electrode for connection and testing. Grounding electrode conductors shall be installed under the bottom flange of the junction box. The grounding electrode shall be centered in the bottom of the junction box with a minimum of 6 inches exposed. The junction box cover shall have the letters "VDOT ELEC" cast in the depression on the top.

Section 700.04(a)2. **Grounding electrode testing** is replaced with the following:

2. **Grounding electrode testing:** Primary grounding electrodes shall be tested after each 10-foot grounding electrode and/or section thereof is installed using the fall of potential (three-point measurement) method. After the primary grounding electrode is installed and tested, the Contractor shall connect to the augmented electrode(s) to conduct a system test. The Contractor shall disconnect the grounding electrode conductor from the service equipment ground bus and bonding bushing before testing the grounding electrodes/system. The Contractor shall test the grounding electrode as required by the manufacturer's instructions for the type of earth testing equipment. The Contractor shall record the readings on a form provided by the Regional Traffic Engineering Office. The completed form shall be signed and submitted to the Engineer after installation of the electrical service grounding.

Section 700.04(e) **Poles, Posts, and Sign Structures** is amended to include the following:

Square tube sign post shall have 7/16-inch (+/- 1/64-inch) openings or knockouts spaced 1-inch on centers on all four sides. When specified on the plans a 2 3/16-inch inner-post shall be used with the 2 ½–inch post for additional strength. The inner-post shall be no less than 6 feet long.

Where posts are to be mounted on a retaining wall or barrier, the Contractor shall provide a mounting bracket, fabricated from steel conforming to the requirements of ASTM A36 and hot dipped galvanized in accordance with ASTM A123. Mounting bracket shall be designed so no connection to the barrier is made on the traffic side of the barrier and shall be secured to the barrier and wall using stainless steel chemically adhesive anchors.

Section 700.04(g)1. **Electrical service and lighting conductor identification** is amended to replace the fifth paragraph with the following:

Color-coding shall be as follows:

2-wire circuits, 120 Volts; 3-wire circuits, 120/240 Volts; 3-phase, 4-wire wye circuits, 208/120 Volts and; 3-phase, 4-wire delta circuits, 240 Volts

Circuit Designation	Color Code
Phase A or Line A	Black
Phase B or Line B	Red or orange*
Phase C	Blue
Grounded Conductor (Neutral)	White or gray** (see exception above)
Equipment Grounding Conductor	Bare, green, or green with one/more yellow stripes

3-phase, 4-wire wye circuits, 480/277 Volts; 3-phase, 3-wire delta circuits, 480 volts

Circuit Designation	Color Code
Phase A	Brown
Phase B	Orange
Phase C	Yellow

Grounded Conductor (Neutral)	White or gray** (see exception above)
Equipment Grounding Conductor	Bare, green, or green with one/more yellow stripes

* For 3-phase, 4-wire delta circuits, Phase B shall be the high leg and shall be orange.
** For outer covering of conductors of different systems that is contained within the same enclosure, refer to Article 200 of the NEC.

Section 700.04(h) **Conduit Systems** is amended to include the following:

When a conduit enters a box, fitting, or other enclosure, a bushing shall be provided to protect the conductor cable from abrasion unless the design of the box, fitting, or enclosure is such to afford equivalent protection of the conductor cable.

Section 700.04(h)2. **Buried conduit systems** is amended to replace the second paragraph with the following:

When conduit is to be installed under an existing roadway, entrance, or fixed object and open cutting is not permitted, conduit shall be installed by an approved directional boring method. Conduit for the directional boring method shall be PVC designed specifically for the directional boring operation or high-density PE. When the plans show more than one conduit at a location to be installed by directional boring, with the Engineers approval the Contractor my elect to install multiple conduits into a single bore at no additional cost to the Department.

MAXIMUM PILOT OR BACK REAMER BIT DIAMETER WHEN ROATED 360^0	
NOMINAL INSIDE PIPE DIAMETER INCHES	**BIT (REAMER) DIAMETER INCHES**
1 - 2"	4" BORE HOLE
2 - 2"	5" BORE HOLE
3 - 2"	8" BORE HOLE
1 - 3"	5" BORE HOLE
2 - 3"	6 ½ " BORE HOLE
3 - 3"	8" BORE HOLE
1 - 4"	6 ½ " BORE HOLE

The Contractor shall use an approved stabilizing agent mixed with potable water to create the drilling fluid (mud slurry) for lubrication and soil stabilization. The fluid viscosity may vary to best fit the soil conditions encountered. Do not use any chemicals or polymer surfactants in the drilling fluid without written consent from the Engineer. The Contractor shall certify to the Engineer in writing that any chemical added to the drilling fluid is environmentally safe and not harmful or corrosive to the conduit system.

The Contractor may elect to use the jacked method to install a pipe sleeve for installation of the required conduit at no additional cost to the Department.

If an obstruction is encountered during the directional boring or jacking operation that requires abandonment of the hole (tunnel), it shall be backfilled with a flowable fill immediately, at no additional cost to the Department.

Section 700.04(i) **Junction Box Covers** is replaced with the following:

(i) **Junction Boxes** shall be installed as follows:

The junction box site shall be excavated such that the depth of the excavation shall be the height of the junction box plus at least twelve inches to allow for bedding aggregate material and such that the width shall be six to eight inches wider than the junction box.

Bedding material shall be No. 68, No. 78, or No. 8 aggregate or Crushed Glass conforming to No. 78, or No. 8 gradation requirements. Aggregate shall be a minimum of twelve inches in depth and entirely cover the bottom of the junction box excavation. The bedding aggregate shall be leveled and tamped prior to installing the junction box.

Junction box shall be installed and leveled to grade prior to backfilling.

Prior to backfilling the interior of polymer concrete junction boxes (JB-S1, JB-S2 and JB-S3) shall be braced with 2 inch by 4 inch lumber using two braces across the width and one brace across the length of the box or as required by the manufacturer. Bracing shall be installed to facilitate removal once back filling and compaction have been completed. The Contractor shall remove internal bracing after the backfilling and compacting operation has been completed.

The cover of the junction box shall be installed prior to backfilling.

The junction box shall be backfilled and compacted around its perimeter utilizing six to eight inch horizontal lifts to where the concrete collar is to begin. Once the concrete collar has cured the remaining area around the collar shall be backfilled and compacted as stated above. Compaction shall be at least ninety percent of the theoretical maximum density as defined in Section 101.02 of the Specifications. A mechanical tamping device shall be used to compact the backfill and soil layer by layer around the perimeter of the junction box. The wheel of a backhoe or other type vehicle shall not be used for compaction of backfill and soil. The internal bracing shall be removed after backfilling and compaction has been completed. The area around the junction box shall be graded and restored as stated in the Specifications.

Junction boxes shall not be installed or backfilled in standing water. Backfill material shall be free of large stones, wood or other debris and shall not be saturated with water.

If a special tool or wrench is required to remove the cover, the Contractor shall furnish the Engineer with five such tools.

Section 700.05—Measurement and Payment for Concrete foundations is replaced with the following:

Concrete foundations will be measured and paid for in units of each or cubic yards of concrete as applicable. When paid for in cubic yards of concrete, no payment will be made for concrete in excess of the cubic yards of concrete required by the foundation design unless otherwise approved by the Engineer. This price shall include foundation design, concrete, reinforcing steel, stub poles, slip base, anchor sleeve, anchor bolts, bolt circle templates, grounding equipment, conduits, excavating, backfilling, compacting, disposing of surplus and unsuitable material, and restoring existing areas.

Section 700.05—Measurement and Payment for Overhead and bridge-mounted sign structures is replaced with the following:

Overhead sign structures will be measured in units of each and will be paid for at the contract unit price per each. This price shall include structural units and supports, hand holes and covers, grounding lugs, electrical systems including conduit and fittings, and identification tags.

Section 700.05—Measurement and Payment for, Junction boxes is replaced with the following:

Junction boxes will be measured in units of each and will be paid for at the contract unit price per each. This price shall include concrete collars, frames and covers, tools to remove the cover, ground rods, ground conductors, grounding lugs, knockouts, cable racks, bracing, aggregate, excavating, backfilling, compacting, disposing of surplus and unsuitable material, and restoring existing areas.

GUIDELINES — PROJECTS REQUIRING TRAFFIC SIGNS,

SS70101-0609 January 22, 2009

VIRGINIA DEPARTMENT OF TRANSPORTATION
2007 ROAD AND BRIDGE SUPPLEMENTAL SPECIFICATIONS

SUPPLEMENTAL SECTION 701—TRAFFIC SIGNS
SECTION 701—TRAFFIC SIGNS

SECTION 701—TRAFFIC SIGNS of the Specifications is amended as follows:

Section 701.03—Procedures is amended as follows:

Section 701.03(a)2. **Sign panels** is amended to include the following:

Extruded sign panels shall be in accordance the drawings and Section 229.02(c) of the Specifications.

Section 701.03(a)3. **Applying reflective background sheeting** is amended to include the following:

Sheeting applied to extruded sign panel sections shall extend over the top edge and down side legs a minimum of 1/16 inch.

Section 701.03(a)5. **Joining sign base panels** is amended to include the following:

Extruded sign panels shall be assembled in accordance with the drawings.

When extruded panels receive a non-micro-prismatic reflective sheeting background, fabricate the panels with rounded corners at a radius of 0.031 inch and chamfer on the edge to facilitate wrapping the reflective sheeting around the edge and fitting the panels together.

When extruded panels receive a micro-prismatic reflective sheeting background, fabricate the panels with square corners. Apply the reflective sheeting to the face and cut flush with the edge of the extrusion.

Section 701.03(d) **Erection** is amended to replace the first sentence of the first paragraph with the following:

Vertical clearance for overhead sign structures shall be no less than 19 feet 0 inch and no more than 21 feet 0 inch from the bottom of the lowest mounted sign panel to the crown of the roadway unless otherwise specified on the plans

Section 701.03(d) **Erection** is amended to delete the last sentence of the first paragraph:

Section 701.03(d) **Erection** is amended to delete the last paragraph:

Section 701.03(d) **Erection** is amended to include the following:

Overlay panels shall be preformed on a flat surface with no protruding bolts or bolt heads on the existing sign panel.

Overlay of overhead sign panels shall be in accordance with the plan details.

GUIDELINES — FOR PROJECTS REQUIRING TRAFFIC SIGNS,

SS70301-0609 January 6, 2009

VIRGINIA DEPARTMENT OF TRANSPORTATION
2007 ROAD AND BRIDGE SUPPLEMENTAL SPECIFICATIONS

SUPPLEMENTAL SECTION 703—TRAFFIC SIGNALS

SECTION 703—TRAFFIC SIGNALS of the Specifications is amended as follows:

Section 703.02—Equipment is amended as follows:

Section 703.02(g)**—Detectors** is amended to delete 1. Magnetic detectors and 2. Magnetic detector amplifiers.

Section 703.03—Procedures is amended as follows:

Section 703.03(e) **Installing signal heads** is amended to replace the last sentence of the second paragraph with the following:

Joints shall be rendered weatherproof by an approved method.

Section 703.03(g)1.**—Magnetic Detectors** is deleted.

Section 703.04—Measurement and Payment is amended as follows:

Section 703.04—Measurement and Payment is amended to delete the sixth paragraph, **Magnetic detector sensing elements** and the fourteenth paragraph, **Cable terminal enclosures**.

Section 703.04—Measurement and Payment is amended to include the following:

Pedestrian actuation will be measured in units of each and will be paid for at the contract unit price per each. This price shall include pedestrian pushbutton, fittings, sign(s), conduit, condulet when required, supplementary grounding electrode, grounding conductor, and concrete foundation when required.

Flashing beacon will be measured in units of each and will be paid for at the contract unit price per each. This price shall include galvanized post, conduit, concrete foundation, grounding electrode, ground conductor, signal heads, breakaway connectors, sign panels and mounting hardware.

Payment will be made under:

Pay Item	Pay Unit
Pedestrain actuation (Standard)	Each
Flashing beacon (Standard)	Each

*These SPECIFICATIONS REVISIONS are subject to change on short notice.